BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BTECH/IMSC **SEMESTER: II**
BRANCH: BT/CEP&P/CHEM. ENGG./CIVIL/MECH/PROD/FT/PHYSICS **SESSION : SP/2019**

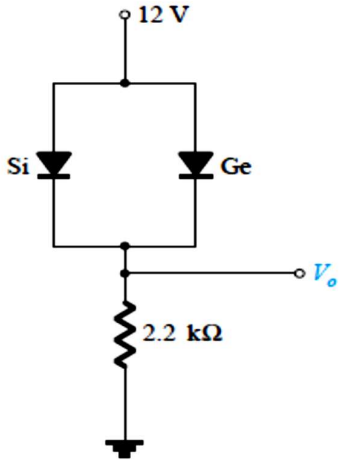
SUBJECT : EC101 BASICS OF ELECTRONICS & COMM. ENGG.

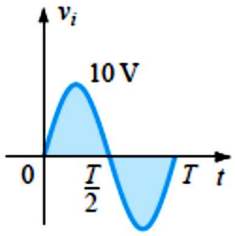
TIME: 02 HOURS **FULL MARKS: 25**

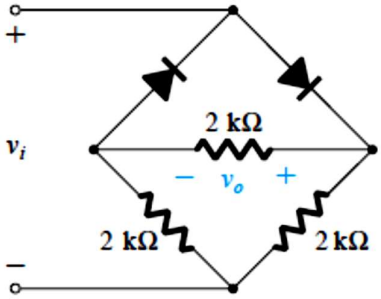
INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates may attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.

Q1 (a) The valence and conduction bands in an *n*-type material are at slightly lower energy levels than the valence and conduction bands in a *p*-type material. Briefly explain. [2]

Q1 (b) Determine output voltage of following circuit (left figure) with elaboration. [3]







Q2 (a) How a load-line can be determined for any series diode configuration circuit? Describe. [2]

Q2 (b) Draw the output wave form for the above (right figure) bridge network. Also calculate the output dc level and the required peak inverse voltage of each diode. [3]

Q3 (a) Elaborate the phenomenon of punch-through for a transistor working in active region. [2]

Q3 (b) Draw the input and output characteristics of common-base transistor configuration. Derive the relation between alpha and beta. [3]

Q4 (a) Define hybrid parameters and draw the small-signal model for the common-emitter configuration. [2]

Q4 (b) Briefly explain the construction and characteristics of JFET. [3]

Q5 (a) Draw the Colpitts oscillator circuits using an n-p-n transistor. [2]

Q5 (b) With the help of neat sketches explain the operation of n-channel **depletion-type** MOSFET. [3]

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